April 4, 2011

Photogrammetry in Indiana

Indiana began its IN-TIME (Indiana-Traffic Incident Management Effort) initiative in January 2009 and the discussion ensued about the amount of time it was taking crash Reconstructionists to complete the measurements at a traffic crash. Soon into our discussion, the topic of photogrammetry was hot on the table.

Photogrammetry is the practice of determining the geometric properties of objects from photographic images. The easy-to-use photogrammetry software produces 3D measurements from photography. Developed for accident reconstruction and forensic measurement photogrammetry equipment is also an affordable and accurate image-based modeling tool for engineering, architecture and heritage recording. Photogrammetry allows investigators to map a crash scene in significantly less time than traditional methods. It alleviates congestion which helps to reduce secondary collisions from traffic backups during crash scene investigation.

Beginning on June 15, 2009 through March 7, 2011, we have documented the use of Photogrammetry at 135 crash incidents. The statistics are as follows:

- 135 total uses of Photogrammetry
- 59 Minutes –average time to measure using photogrammetry for roadway scenes only
- 2 Hours 46 Minutes – Average Estimated Measurement Time NOT using Photogrammetry
- ***1 Hour and 47 Minutes***: Average Time SAVED PER ROAD CLOSING SCENE using Photogrammetry for these 135 scenes

As you know, you can make statistics say whatever you want it to say. However, if you look at 107 minutes saved at each of these crash scenes and take that times 4 minutes, it takes 4 minutes to get traffic back to its normal flow for every minute the roadway is closed, we have 54,356 minutes. That converts to 906 hours we have saved Indiana residents or Indiana travelers from sitting in the traffic queue or working their way through traffic. IN-TIME believes this time savings is and will be a significant factor in saving lives from secondary crashes.

On October 22, 2009, there was a significant crash at I-69 southbound to I-465 southbound on the northeast side of Indianapolis. A semi tractor pulling an LP gas tanker failed to negotiate the ramp, rolled and exploded. The intense heat from the explosion was believed to have compromised the integrity of the bridges. Our local Reconstructionists estimated it would take 10-12 hours to document this scene using the typical total station process. NTSB estimated it would have taken up to 18 hours from them to complete the measurements they needed. It took three of our photogrammetry trained Troopers 1 hour and 10 minutes to document the scene with photographs and that was done under the direction of a Safety Officer because the Fire Department was still spraying the tank to insure no further explosion. THIS IS SIGNIFICANT!

The week of September 28, 2009 we trained 5 Indiana State Police Troopers and one Boone County Sheriff's Deputy in the full Train the Trainer course of photogrammetry through iWitness. This is the photogrammetry product Indiana chose to purchase. Since June 20, 2009 we have trained 27 ISP and 17 other Law Enforcement personnel in the full photogrammetry software. We have trained 89 ISP and 24 other Law Enforcement personnel in just taking photos for photogrammetry. Those trained in photo only can simply e-mail the photos to a software trained officer and have the crash reconstructed.

"Our total station battery froze up – so it was useless on scene. I proceeded to map a 900' highway incident with my digital camera in 5F temperature and then use iWitness back in the warmth of the office. Mapping a scene with a digital camera is fast and easy to accomplish in iWitness. I've proven many times that iWitness is extremely accurate. It's an awesome product for investigators." Thomas W Quinn, Indiana State Police

The initial reason for examining photogrammetry was to cut down on the amount of time we physically have lanes closed due to crash investigation. We believe this time savings is crucial to reducing secondary crashes, therefore saving lives and personnel injury. Photogrammetry also allows for much better documentation of a scene for initial and future investigation.

Thomas E. Melville, Major
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